



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2024-0041; Project Identifier AD-2024-00032-E]

RIN 2120-AA64

Airworthiness Directives; International Aero Engines, AG Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to adopt a new airworthiness directive (AD) for certain International Aero Engines, AG (IAE AG) Model V2500 engines. This proposed AD was prompted by an analysis of an event involving an International Aero Engines, LLC (IAE LLC) Model PW1127GA-JM engine, which experienced a high-pressure compressor (HPC) 7th-stage integrally bladed rotor (IBR-7) separation that resulted in an aborted takeoff. This proposed AD would require performing an angled ultrasonic inspection (AUSI) of certain high-pressure turbine (HPT) 1st-stage hubs and HPT 2nd-stage hubs for cracks and replacing if necessary. This proposed AD would also require accelerated replacement of certain HPT 1st-stage hubs and HPT 2nd-stage hubs. The FAA is proposing this AD to address the unsafe condition on these products.

DATES: The FAA must receive comments on this proposed AD by [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to [regulations.gov](https://www.regulations.gov). Follow the instructions for submitting comments.
- Fax: (202) 493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

AD Docket: You may examine the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2024-0041; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, any comments received, and other information. The street address for Docket Operations is listed above.

Material Incorporated by Reference:

- For Pratt & Whitney (PW) and IAE AG service information identified in this NPRM, contact International Aero Engines, AG, 400 Main Street, East Hartford, CT 06118; phone: (860) 565-0140; email: help24@pw.utc.com; website: connect.prattwhitney.com.

- You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

FOR FURTHER INFORMATION CONTACT: Carol Nguyen, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: (781) 238-7655; email: carol.nguyen@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under ADDRESSES. Include “Docket No. FAA-2024-0041; Project Identifier AD-2024-00032-E” at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this proposal because of those comments.

The FAA has been informed that PW has done some outreach with affected operators regarding the proposed corrective actions for this unsafe condition. As a result, affected operators are already aware of the proposed corrective actions and, in some

cases, have already begun planning for replacement of the affected parts. Therefore, the FAA has determined that a 30-day comment period is appropriate given the particular circumstances related to the proposed correction of this unsafe condition.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to regulations.gov, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this NPRM.

Confidential Business Information

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to Carol Nguyen, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

Background

On December 24, 2022, an Airbus Model A320neo airplane, powered by IAE LLC Model PW1127GA-JM engines, experienced a failure of the HPC IBR-7 that resulted in an engine shutdown and aborted take-off. Following this event, the manufacturer conducted a records review of production and field-returned parts and re-evaluated their engineering analysis methodology. The new analysis found that the failure of the HPC IBR-7 was caused by a nickel powdered metal anomaly, similar in nature to an anomaly previously observed on March 18, 2020, when an Airbus Model A321-231 airplane, powered by IAE AG Model V2533-A5 engines, experienced an uncontained

HPT 1st-stage hub failure that resulted in high-energy debris penetrating the engine cowling. The analysis also concluded that there is an increased risk of failure for a subpopulation of HPT 1st-stage hubs and HPT 2nd-stage hubs that were manufactured from the same production campaign (a batch of nickel powdered metal) as the HPT 1st-stage hub that failed on March 18, 2020; these parts have a higher likelihood of containing the nickel powdered metal anomaly and are susceptible to failure much earlier than previously determined. As a result, the FAA is proposing an accelerated AUSI for certain HPT 1st-stage hubs and HPT 2nd-stage hubs and, depending on the results of the inspections, replacing the HPT 1st-stage hubs or HPT 2nd-stage hubs. This proposed AD would also require accelerated replacement of certain HPT 1st-stage hubs and HPT 2nd-stage hubs. Certain IAE AG Model V2522-A5, V2524-A5, V2525-D5, V2527-A5, V2527E-A5, V2527M-A5, V2528-D5, V2530-A5, V2531-E5, and V2533-A5 engines are among the products affected by this condition, which, if not addressed, could result in hub failure, release of high-energy debris, damage to the engine, damage to the airplane, and possible loss of the airplane.

FAA's Determination

The FAA is issuing this NPRM after determining that the unsafe condition described previously is likely to exist or develop on other products of the same type design.

Related Service Information under 1 CFR Part 51

The FAA reviewed IAE AG Non-Modification Service Bulletin (NMSB) V2500-ENG-72-0720, dated November 20, 2023; and PW Special Instruction NO. 189F-23, dated November 20, 2023 which only applies to the IAE AG V2531-E5 Model engine. This service information specifies procedures for performing an AUSI for cracks on affected HPT 1st-stage hubs and HPT 2nd-stage hubs. This service information also specifies the list of affected HPT 1st-stage hubs and HPT 2nd-stage hubs, identified by part number and serial number, installed on certain IAE AG engines.

This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

Proposed AD Requirements in this NPRM

This proposed AD would require performing an AUSI of certain HPT 1st-stage hubs and HPT 2nd-stage hubs and, depending on the results of the inspections, replacing the HPT 1st-stage hubs or HPT 2nd-stage hubs. This proposed AD would also require accelerated replacement of certain HPT 1st-stage hubs and HPT 2nd-stage hubs.

Interim Action

The FAA considers this proposed AD to be an interim action. The unsafe condition is still under investigation by the manufacturer and, depending on the results of that investigation, the FAA may consider further rulemaking action.

Costs of Compliance

The FAA estimates that this AD, if adopted as proposed, would affect 116 engines installed on airplanes of U.S. registry. The FAA estimates that 40 engines would need an AUSI of the HPT 1st-stage hub; 40 engines would need an AUSI of the HPT 2nd-stage hub; 67 engines would need replacement of the HPT 1st-stage hub; and 49 engines would need replacement of the HPT 2nd-stage hub.

The FAA estimates the following costs to comply with this proposed AD:

Estimated costs

Action	Labor Cost	Parts Cost	Cost per product	Cost on U.S. operators
AUSI of HPT 1st-stage hub	5 work-hours x \$85 per hour = \$425	\$0	\$425	\$17,000
AUSI of HPT 2nd-stage hub	5 work-hours x \$85 per hour = \$425	\$0	\$425	\$17,000
Replace HPT 1st-stage hub	100 work-hours x \$85 per hour = \$8,500	\$460,000	\$468,500	\$31,389,500
Replace HPT 2nd-stage hub	100 work-hours x \$85 per hour = \$8,500	\$360,000	\$368,500	\$18,056,500

The FAA has included all known costs in its cost estimate. According to the manufacturer, however, some of the costs of this AD may be covered under warranty, thereby reducing the cost impact on affected operators.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

The FAA determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Would not affect intrastate aviation in Alaska, and
- (3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive:

International Aero Engines, AG: Docket No. FAA-2024-0041; Project Identifier AD-2024-00032-E.

(a) Comments Due Date

The FAA must receive comments on this airworthiness directive (AD) by [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

This AD is related to AD 2022-02-09, Amendment 39-21906 (87 FR 7029, February 8, 2022) (AD 2022-02-09).

(c) Applicability

This AD applies to International Aero Engines, AG (IAE AG) Model V2522-A5, V2524-A5, V2525-D5, V2527-A5, V2527E-A5, V2527M-A5, V2528-D5, V2530-A5, V2531-E5, and V2533-A5 engines.

(d) Subject

Joint Aircraft System Component (JASC) Code 7230, Turbine Engine.

(e) Unsafe Condition

This AD was prompted by an analysis of an event involving an International Aero Engines, LLC Model PW1127GA-JM engine, which experienced failure of a high-pressure compressor 7th-stage integrally bladed rotor that resulted in an engine shutdown and aborted takeoff. The FAA is issuing this AD to prevent failure of the high-pressure turbine (HPT) 1st-stage hub and HPT 2nd-stage hub. The unsafe condition, if not addressed, could result in uncontained hub failure, release of high-energy debris, damage to the engine, damage to the airplane, and loss of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

(1) For engines with an installed part, part number (P/N), and serial number (S/N) listed in Table 1 to paragraph (g)(1) of this AD, with no angled ultrasonic inspection (AUSI) performed or the AUSI inspected part was installed on or after November 1, 2023, at the next engine shop visit after the effective date of this AD before exceeding the applicable cycle limit specified in Table 1 to paragraph (g)(1) of this AD, perform an AUSI of the affected parts for cracks in accordance with the applicable service information listed in Table 1 to paragraph (g)(1) of this AD.

Table 1 to Paragraph (g)(1) - AUSI Compliance Times

Part	Table S/N is listed in	Previously operated in high-thrust model engine	Cycle limit from the effective date of this AD	Applicable service information
HPT 1st-stage hub P/N 2A5001	Table 1 of IAE AG Non-Modification Service Bulletin V2500-ENG-72-0720, dated November 20, 2023 (IAE AG NMSB V2500-ENG-72-0720)	Yes	100 flight cycles (FCs)	Accomplishment Instructions, paragraph 5., of IAE AG NMSB V2500-ENG-72-0720
	Table 1 of Pratt & Whitney (PW) Special Instruction NO. 189F-23, dated November 20, 2023 (PW SI 189F-23)			Accomplishment Instructions, paragraph 5., of PW SI 189F-23
	Table 1 of IAE AG NMSB V2500-ENG-72-0720	No	700 FCs	Accomplishment Instructions, paragraph 5., of IAE AG NMSB V2500-ENG-72-0720
HPT 2nd-stage hub P/N 2A4802	Table 2 of IAE AG NMSB V2500-ENG-72-0720	Yes	800 FCs	Accomplishment Instructions, paragraph 6., of IAE AG NMSB V2500-ENG-72-0720
	Table 2 PW SI 189F-23			Accomplishment Instructions, paragraph 6., of PW SI 189F-23
	Table 2 of IAE AG NMSB V2500-ENG-72-0720	No	1100 FCs	Accomplishment Instructions, paragraph 6., of IAE AG NMSB V2500-ENG-72-0720

(2) For parts inspected in accordance with paragraph (g)(1) of this AD, within 4,000 FCs from accomplishment of the AUSI required by paragraph (g)(1) of this AD or at the next HPT module removal after the AUSI required by paragraph (g)(1) of this AD, whichever occurs first, remove the part from service and replace with a part eligible for installation.

(3) If any crack is found during the inspections required by paragraphs (g)(1) of

this AD, before further flight, remove the affected part from service and replace with a part eligible for installation.

(4) For engines with an AUSI inspected part installed prior to November 1, 2023, having a P/N and S/N listed in Table 2 to paragraph (g)(4) of this AD, at the next HPT module removal after the effective date of this AD, but before exceeding the applicable cycle limit specified in Table 2 to paragraph (g)(4) of this AD, remove the affected part from service and replace with a part eligible for installation.

Table 2 to Paragraph (g)(4) - Part Replacement Compliance Times

Part	Table S/N is listed in	Previously operated in high-thrust model engine	Cycle limit from the effective date of this AD
HPT 1st-stage hub P/N 2A5001	Table 1 of IAE AG NMSB V2500-ENG-72-0720	Yes	1,800 FCs
	Table 1 of PW SI 189F-23		
	Table 1 of IAE AG NMSB V2500-ENG-72-0720	No	2,800 FCs
HPT 2nd-stage hub P/N 2A4802	Table 2 of IAE AG NMSB V2500-ENG-72-0720	Yes	3,400 FCs
	Table 2 of PW SI 189F-23		
	Table 2 of IAE AG NMSB V2500-ENG-72-0720	No	3,800 FCs

(5) For engines with an installed part that has a P/N and S/N listed in Table 3 to paragraph (g)(5) of this AD, at the next HPT module removal after the effective date of this AD, but before exceeding the applicable cycle limit specified in Table 3 to paragraph (g)(5) of this AD, remove the affected part from service and replace with a part eligible for installation.

Table 3 to Paragraph (g)(5) - Part Replacement Compliance Times

Part	Table S/N is listed in	Previously operated in high-thrust model engine	Cycle limit from the effective date of this AD
HPT 1st-stage hub P/N 2A5001	Table 3 of IAE AG NMSB V2500-ENG-72-0720	Yes	1,800 FCs
	Table 3 of IAE AG NMSB V2500-ENG-72-0720	No	2,800 FCs
HPT 2nd-stage hub P/N 2A4802	Table 4 of IAE AG NMSB V2500-ENG-72-0720	Yes	3,400 FCs
	Table 4 of IAE AG NMSB V2500-ENG-72-0720	No	3,800 FCs

(h) Definitions

(1) For the purposes of this AD, a “part eligible for installation” is an HPT 1st-stage disk or HPT 2nd-stage disk having an S/N that is not listed in IAE AG NMSB V2500-ENG-72-0720 or PW SI 189F-23.

(2) For the purposes of this AD, an “HPT module removal” is when the HPT rotor and stator assembly are removed from the engine.

(3) For the purposes of this AD, “Previously operated in high-thrust model engine” refers to HPT 1st-stage hubs or HPT 2nd-stage hubs that have previously operated in an IAE AG Model V2527E-A5, V2527M-A5, V2528-D5, V2530-A5, V2531-E5, or V2533-A5 engine for any duration.

(4) For the purposes of this AD, an “engine shop visit” is the induction of an engine into the shop for maintenance involving the separation of pairs of major mating engine flanges, H-P, except for the following situations, which do not constitute an

engine shop visit:

(i) Separation of engine flanges solely for the purposes of transportation without subsequent engine maintenance.

(ii) Engine removal for the purpose of performing field maintenance activities at a maintenance facility in lieu of performing them on-wing.

(5) For the purposes of this AD, the date that an AUSI inspected part was installed is the date of the authorized release certification for the shop visit at which the part was first installed after the AUSI was performed.

(i) Terminating Action to AD 2022-02-09

Compliance with paragraph (g)(1) of this AD satisfies the requirements of AD 2022-02-09.

(j) Alternative Methods of Compliance (AMOCs)

(1) The Manager, AIR-520 Continued Operational Safety Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the AIR-520 Continued Operational Safety Branch, send it to the attention of the person identified in paragraph (k) of this AD.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(k) Additional Information

For more information about this AD, contact Carol Nguyen, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: (781) 238-

7655; email: carol.nguyen@faa.gov.

(I) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) International Aero Engines AG (IAE AG) Non-Modification Service Bulletin V2500-ENG-72-0720, dated November 20, 2023.

(ii) Pratt & Whitney (PW) Special Instruction NO. 189F-23, dated November 20, 2023.

(3) For PW and IAE AG service information identified in this AD, contact International Aero Engines, AG, 400 Main Street, East Hartford, CT 06118; phone: (860) 565-0140; email: help24@pw.utc.com; website: connect.prattwhitney.com.

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

(5) You may view this material at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, visit www.archives.gov/federal-register/cfr/ibr-locations or email

fr.inspection@nara.gov.

Issued on January 24, 2024.

Victor Wicklund,
Deputy Director, Compliance & Airworthiness Division,
Aircraft Certification Service.
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